SCIENCE (PHYSICS) CURRICULUM MAP

FURTHER STUDY

A level Physics; Level 3 BTEC Science

CAREER PATHS

University, Researcher, Forensic Scientist, Education and Training

SKILLS

Critical analysis, scientific investigation, evaluation

Assessment: multiple shorter assessments and two exam questions on electricity, forces, matter and ionising radiation, and space

REVISION & EXAMS

REVISION

Electricity and magnetism

- ❑ Energy transfers in electric circuits
- ❑ Substitute into and rearrange equations to calculate electrical quantities
- ❑ Use of current, charge, potential difference and resistance in electric circuits
- ❑ Transformers in the national grid
- ❑ Electricity and magnetism
- ❑ Transformers, dynamos and motors

Forces, Matter and Ionising Radiation

- ❑ Understanding of resultant force and free-body diagrams
- ❑ How the different types of radiation affect matter
- ❑ Analyse how forces can deform materials
- ❑ Resolving vector diagrams
- ❑ How multiple forces affect the motion of an object
- ❑ Knowledge of materials and real life scenarios

Assessment: mock exams covering all content to-date

Space

- ❑ Objects in the solar system.
- ❑ The force of gravity.
- ❑ Frequency and wavelength
- ❑ Structure of the universe
- ❑ Star processes
- ❑ Mass vs Weight
- ❑ Life cycle of a star
- ❑ The doppler effect
- ❑ Gas pressure
- ❑ Electromagnetic waves and the atmosphere

Assessment: synoptic 40 marks, with 20 marks on the content from radio-active decay, and 20 marks on the content from forces and energy, electrical power and heating

Assessment: synoptic 20 marks on the EM spectrum and waves

Radioactive Decay

- ❑ Structure of the atom
- ❑ Alpha, beta and gamma radiation
- ❑ Explain why a nucleus may or may not be radioactive
- ❑ Measuring radiation
- ❑ Background radiation
- ❑ Analyse data to determine the type of radioactivity present
- ❑ Half-life calculations and nuclear decay equations
- ❑ Analysing half-life and radioactive materials

The EM Spectrum and Waves

- ❑ Waves and energy transfer
- ❑ Reflection and refraction
- ❑ Electromagnetic waves
- ❑ Wave frequency and energy transfer
- ❑ Waves at a boundary
- ❑ Uses of EM waves

Acceleration as a Vector and Matter

- ❑ Calculating speed and acceleration
- ❑ Using DT and VT graphs to analyse a journey
- ❑ History of the structure of the atom
- ❑ Rutherford's alpha scattering experiment
- ❑ Calculating gradients

YEAR 11

Assessment: End of year exams - GCSE past paper. 60 marks on the topics from GCSE paper 1

Assessment: assessment one is a test made up of three exam questions. One on a core concept, one on the content from space and one from the content from the EM spectrum and waves, or acceleration as a vector and matter

Energy, Electrical Power and Heating

- ❑ Power, heat capacity and latent heat
- ❑ Resistance and thermal energy transfer
- ❑ Heat and change in particles
- ❑ Internal substance energy
- ❑ Analyse series and parallel circuits

Forces

- ❑ Force and acceleration
- ❑ Momentum – kinetic energy
- ❑ Use of F=ma
- ❑ Drawing free body diagrams
- ❑ Centripetal force and circular motion
- ❑ Conservation of momentum to collisions and explosions

YEAR 10

Assessment: synoptic 40 marks, with 20 marks on the content from radio-active decay, and 20 marks on the content from forces and energy, electrical power and heating

Assessment: synoptic 40 marks, with 20 marks on the content from energy, electrical power and heating; and 20 marks on content from forces

Assessment: 15 marks - a series of short answer questions on energy stores and transfers; 30 mark short answer test on the content from forces

SCIENCE SKILL
Scientific knowledge and conceptual understanding

SCIENCE SKILL
The nature, processes and methods of science

SCIENCE SKILL
Analysis, evaluation and measurement

SCIENCE SKILL
Experimental skills and investigations